

Techniques — Methoden — Techniques

Distribution analysis of Surrey Lepidoptera using the DMAP computer package

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Résumé

Le progiciel DMAP pour la réalisation de cartes de répartition et de cartes de comparaison nous est présenté. Les possibilités d'application nous sont montrées à partir du projet de cartographie faunistique du comté anglais de Surrey.

Zusammenfassung

Die Computer Software DMAP zur Herstellung von Verbreitungs- und Auflegekarten wird präsentiert. Die Anwendungsmöglichkeiten werden an Beispielen aus dem faunistischen Kartierungsprojekt der englischen Grafschaft Surrey gezeigt.

DMAP is a computer package for distribution and coincidence mapping available for IBM-compatible personal computers. This article describes the use of the DMAP package for insect data analysis in Surrey, UK. For the past seven years several members of the Croydon Natural History Society have been collecting records of various insect groups with the aim of producing county lists for Surrey. The groups currently being studied are the macrolepidoptera, Neuroptera, Orthoptera, Odonata, ladybirds and shieldbugs. The records for the Lepidoptera and Neuroptera have recently been transferred to computer and DMAP has been used to produce distribution maps, both for analysis and for use in the final publication.

DMAP reads five different data files and assembles the information to produce the maps. These files are the distribution data file, the boundary data file, the plotting parameter file, the map text file and

a names dictionary. There is a default file name for each file, but alternative files may be specified on the command line at start up. In the Surrey Insect Recording Scheme, batch files are called up by a menuing system to run the program in different ways. The ability to use different files means that the data for Neuroptera (a small group with relatively few records), can be kept separate from the data for the Lepidoptera which keeps down the time required to read the file and produce the maps. Different boundary files can be used to produce just the county boundary, or to superimpose additional features such as subdivisions, geology, altitude or river systems. The map text file allows given text to be placed at given map references and can be used to incorporate towns or other textual information on the maps (Fig. 1). The names dictionary allows a species to be called up by a code number (e.g. Bradley & Fletcher number for Lepidoptera or Biological Records Centre number for Neuroptera), rather than the full species name which will be displayed at the top of the map. Various other options can be used on the command line such as altering the colours on a colour monitor, inverting the image (using black and white as it would appear on paper), or suppressing the grid.

A very useful feature is the ability to sample grid references to produce maps with a smaller scale than the original records. If the records are kept with a 1km grid reference the maps can be produced on a 1 km, tetrad (2 km), 5 km, or 10 km basis ; thus the same data can be used to produce tetrad maps for vice-county recording and 10 km maps which would be compatible with national recording schemes (Figs 2,3). A range of different symbol types, sizes and degree of filling can be used to indicate date classes or to distinguish between a breeding colony and a single record.

In Surrey, the species data is held on PC-File V, a simple, dBase III+ compatible, flat file database which does however have a fairly sophisticated report generating language. This is used to produce a disk file in the format of the data file as read by DMAP. DMAP is then run separately to view the maps. It is also possible to write a linking program so that DMAP can directly read the database file.

Once a map has been viewed on screen it can be printed by sending directly to a dot-matrix printer (9 or 24 pin) or an inkjet or laser printer using Hewlett-Packard printer command language. The best results are to be obtained by using a PostScript printer. It is also possible to produce encapsulated PostScript files (.EPS) which can be used in a desktop publishing program, or as a PC-Paintbrush file

Vice-county 17 SURREY



Fig. 1. Surrey towns. The distribution data file contains the grid references of the towns in Surrey and the map text file contains their names. A reduced point size of text is used for the town locations.

C.chloerata Mab. Sloe Pug

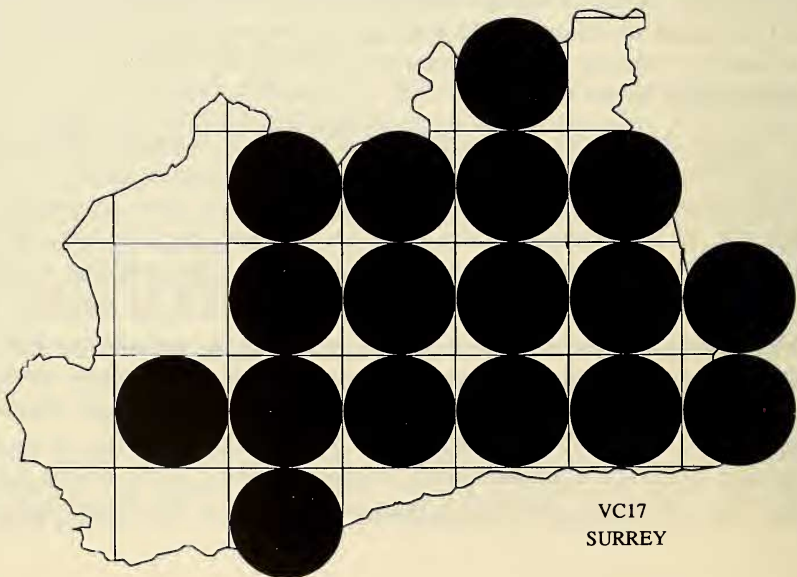


Fig. 2. *Eupithecia chloerata* MAB. (Sloe Pug Moth). Surrey distribution data produced on a 10km basis compatible with the Joint Nature Conservation Committee's project on the red data book and nationally notable species.

L.coridon Poda Chalk-hill Blue

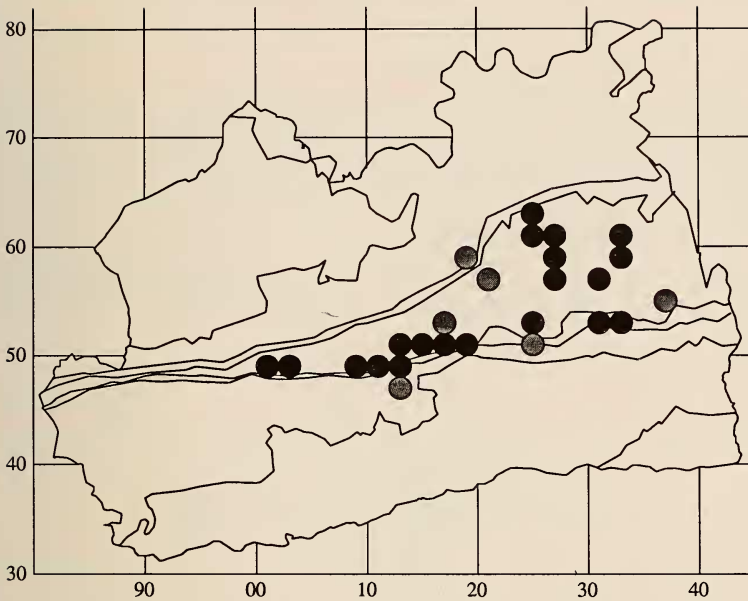


Fig. 3. *Lysandra coridon* PODA (Chalk-hill Blue). Surrey distribution data produced on a tetrad basis and superimposed on the geological features showing the restriction to the chalk. Black symbols represent records relating to the 1980's and grey symbols records from the 1970's.

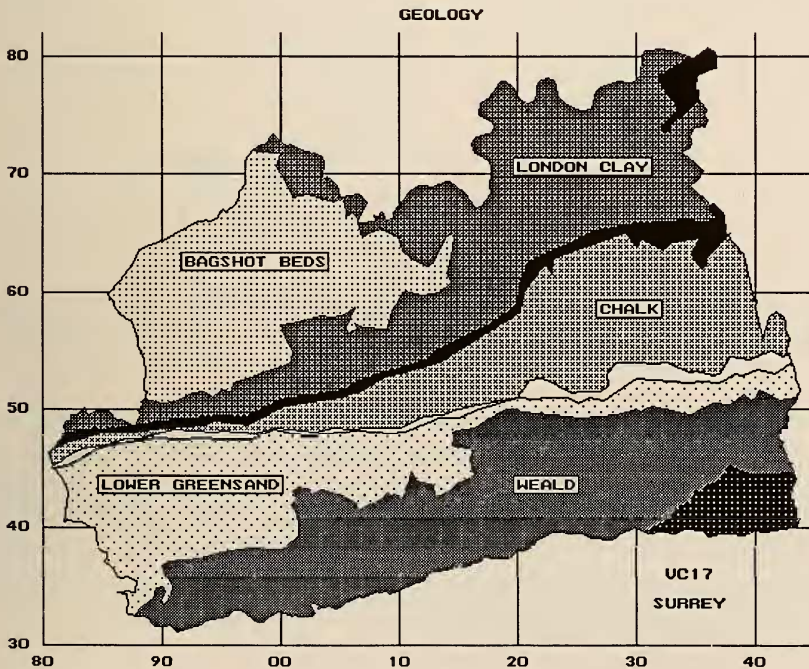


Fig. 4. Surrey geology. The different geological areas have their outlines on the boundary data file. The map was produced as a PC-Paintbrush file, imported into Windows Paintbrush and the area fill feature used to produce fill patterns for each type of geological formation.

(.PCX) which can be imported into various painting programs (Fig. 4) or desk top publishing programs.

In addition to the standard DMAP program there is also a "special installation" which can be used to produce British Isles maps ; this includes a facility to rotate the Irish records to allow for the different orientation of the Irish and British National grids, the ability to shift records for Orkney and Shetland so that they are placed in the north-east corner of the map rather than at their geographical locations, and a detailed boundary file of Britain, Ireland, and the off shore islands (Fig. 5).

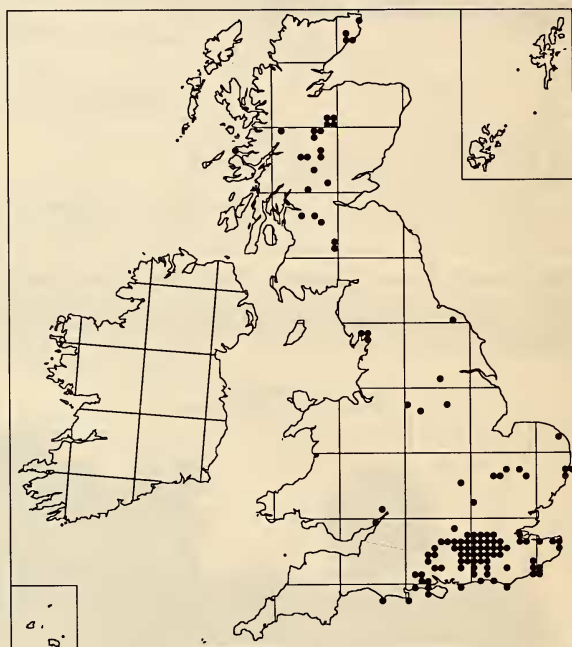


Fig. 5. British Isles map. The distribution of an entomologist ! Produced by using the map references of the sites that G.A.C has visited.

The DMAP package is supplied on 5.25" or 3.5" floppy diskettes. It contains a number of supporting programs including a simple text editor, a simple database program, and a program for digitising boundary or species data from existing maps using a graphics tablet. For further information about DMAP and its availability, write to A.J.M. For further information about the Surrey Insect Recording Scheme, or the implementation of DMAP there, write to G.A.C.